

REMARKS

In the Office Action of March 9, 2006, the Examiner suggested a substitute specification to correct informalities in the specification. A substitute specification is attached to this response. No new matter has been added.

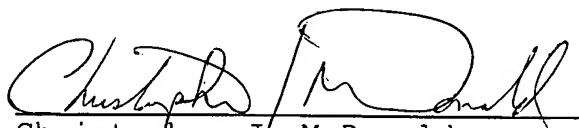
The Examiner rejected claims 1, 3-6, 8 and 10-12 as being anticipated or obvious in view of European Patent No. 517,206. In addition, claim 9 was rejected as obvious over the European patent in view of U.S. 5,332,188 (Davis et al.). The Examiner relied upon Davis et al. for disclosing ribs serving as reinforcements. The Examiner indicated claims 2 and 7 were allowable and these claims have been rewritten in independent form.

Claims 1 and 6 have been amended to state that each spoke is formed by a half-shell having a cavity joined to another half-shell. These claims are directed to an embodiment in which only one half-shell has a cavity. This feature is not disclosed in the prior art and the claims, as amended, are allowable.

The claims are allowable over the prior art and favorable action is eagerly and earnestly solicited. If any issues remain, and the Examiner believes a telephone conversation would resolve such issues, the Examiner is urged to contact the undersigned attorney.

A three month extension of time accompanies this response. If any additional fees are due and owing, the Commissioner is authorized to charge Deposit Account 08-0455 the deficiency.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Christopher J. McDonald", is written over a horizontal line.

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METHOD FOR FORMING BASES FOR ROTATABLE OFFICE CHAIRS AND
BASE OBTAINED BY THE METHOD

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FIELD OF THE INVENTION

This invention relates to a method for forming bases
for rotatable office chairs and a base obtained by the
method.

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BACKGROUND OF THE INVENTION

Office chairs are known comprising a spoke-type base
with feet or wheels and a column mounted on said base and
provided with a spring, generally in the form of a gas
15 piston, to adjust the height of the sitting plane from the
floor.

A known type of such a base is obtained in one
injection moulding step from thermoplastic materials, and
presents a substantially U-shaped open cross-section to
20 enable the male die punch to be extracted.

The current regulations regarding safety and
reliability tests for chairs require that the base be
subjected to a series of verification tests (compressions)
to verify their structural strength and the absence of
25 permanent deformations which could prejudice their
integrity.

The load conditions to which a single base spoke is
subjected can be schematically represented by likening the

spoke to a beam fixed at one end to the central core and stressed by a vertical force acting upwards from below and applied at the point to which the wheel or foot is connected. This beam is therefore subjected to straight
5 flexure with its lower fibres subjected to tension and its upper fibres to compression, and presents its maximum bending moment in correspondence with its fixed end, i.e. where the spoke joins the central core.

The base spokes are also subjected to twisting due
10 to the misalignment between the wheel and the pin connecting the wheel to the base.

In those bases constructed in accordance with the known art the spokes are formed with an inverted U profile, i.e. with the material-lacking region lying
15 precisely where the fibres are subjected to high tension forces.

Consequently to resist these stresses, the spokes are reinforced by increasing their thickness, adding reinforcement elements and inserting structural metal
20 parts, or by using materials with better mechanical characteristics.

However all these additions result in considerable increases in material and manufacturing costs.

An object of the invention is to eliminate these drawbacks by providing a chair base presenting high resistance to the stresses concerned.

Another object of the invention is to provide a base
5 which enables the price/performance trade-off to be shifted to a level not attainable by current bases present on the market.

These and other objects which will be apparent from the ensuing description are attained according to the
10 invention by a method for forming office chair bases as described in claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

~~A preferred embodiment of the invention is described
15 in detail below by way of non-limiting example with reference to the accompanying drawings, in which:~~

Figure 1 shows an example of a chair with base and wheels;

Figure 2 shows an enlargement of the base in the wheel
20 connection region;

Figure 3 is a perspective sectional view of a base spoke of the known art;

Figure 4 is a perspective sectional view of a base spoke
obtained in accordance with the invention;

25 Figure 5 shows the two half-shells to be assembled; and

Figure 6 shows a complete base according to the invention—.

DETAILED DESCRIPTION OF THE INVENTION

5 As can be seen from the figures the office chair base according to the invention comprises a plurality of spokes 2 extending radially from a central ring 4 into which the column for supporting the seating portion and back-rest is inserted.

10 The base of the invention is formed by structurally joining together (for example by welding, mechanical coupling, glueing) two plastics concave half-shells hereinafter known as the lower half-shell 6 and the upper half-shell 6'. When joined together, the protrusions of
15 the two half-shells, which are substantially of U cross-section, form spokes of closed cross-section. To facilitate this joining, the two half-shells present longitudinal edges 8, 8' along the joining region. Each spoke has a greater cross-section in the most stressed
20 region, i.e. at its connection to the ring, and a smaller cross-section in the least stressed region, i.e. close to the wheel connection point. In addition, the cross-section presents a preferably vertical extension, with thinner vertical walls 14, 14' and thicker upper and lower
25 transverse walls 10, 10'.

Moreover, both the lower half-shell and the upper half-shell are provided along their horizontal portion 10, 10' with a plurality of stiffening ribs 12, 12'.

5 All this means that at each cross-section the surface of the vertical portions 14, 14' is much less than the surface of the horizontal portion 10, 10' plus the ribs 12, 12'. This type of cross-section enables distribution of the material to be optimized by increasing its use in the more stressed regions, i.e. within the
10 upper and lower portions, and reducing it within the lateral vertical portions.

To prevent the spokes from undergoing undesirable opening-out during stressing, transverse ribs (not shown in the drawings) are also provided.

15 The part can be further stiffened by using ribs in the region most distant from the neutral axis and suitably distancing the sides of the upper and lower sections from the neutral axis.

The closed cross-section resulting from joining
20 together the two half-shells also determines a greater resistance to twisting.

From the foregoing it is apparent that the chair base according to the invention presents the advantage, given its greater strength, of a product with superior
25 mechanical performance for the same material, or for equal

performance enables the quantity of material to be reduced, or a material with inferior characteristics to be chosen, with a competitive advantage in terms of cost.

A B S T R A C T

A method for forming rotatable bases for offices
chairs characterised by structurally joining together at
least two half-shells ~~(6, 6')~~ to form overall a plurality
5 of spokes ~~(2)~~, each consisting of an elongated box-shaped
body, and a central ring ~~(4)~~ into which a column is
inserted.